REMARKS/ARGUMENTS

Claims 4-6, 16 and 17 have been cancelled without prejudice or disclaimer. Claim 7 has been amended. Claims 7-15 are currently pending in this application.

Claim 7 has been amended to indicate that the VGO produced by the defined method comprises a measured analine point from about 110°F to about 150°F. Support for this amendment may be found in Tables 15 (bottom row) and 17A (bottom row) on pages 47 and 49-50, respectively.

Election/Restrictions

Applicant affirms the election with traverse of claims 7-15 (Group II), which was made in a telephone conversation with Examiner on 9/16/2004. Previously pending claims 4-6, 16 and 17 have, therefore, been cancelled without prejudice or disclaimer. Applicant reserves the right to pursue the subject matter of the cancelled claims in a continuation of the present application.

Rejections Under 35 U.S.C. 103(a)

Examiner has rejected claims 7-15 under 35 U.S.C. 103(a) as being unpatentable over Freel et al. (U.S. Patent No. 5,792,340) in view of Chomyn (U.S. Patent No. 5,858,213) or Mosby et al. (U.S. Patent No. 5,626,741). Applicant respectfully traverses Examiner's rejection against claims 7-15 based on the comments set forth below.

Under 35 U.S.C. §103, in order to set forth a case of *prima facie* obviousness the differences between the teachings in the cited reference must be evaluated in terms of the whole invention, and the prior art must provide a teaching or suggestion to the person of ordinary skill in the art to have made the changes that would produce the claimed product.

See, e.g., Lindemann Maschinen-fabrik Gmbh v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 U.S.P.Q.2d 481, 488 (Fed. Cir. 1984).

The mere fact that prior art may be modified to produce the claimed product does not make the modification obvious unless the prior art suggests the *desirability* of the modification. *In re Fritch,* 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992); *see, also, In re Papesh,* 315 F.2d 381, 137 U.S.P.Q.43 (CCPA 1963). Freel et al. describes the rapid thermal processing of a carbonaceous material to produce a liquid product, but does not teach or suggest the *desirability* of isolating a VGO product from the liquid product produced by the disclosed process. As a consequence, there would have been no motivation for one of skill in the art to have modified the process of Freel et al. to isolate a VGO product.

Furthermore, Examiner's assertion that modification of the disclosed process of Freel et al. to meet the claimed invention would have been obvious to one of skill of the art at the time the claimed invention was made is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings Freel et al. with Chomyn or Mosby et al. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). In particular, it is respectfully pointed out that both Mosby et al. and Chomyn describe obtaining a VGO from a distillation processes, and using the VGO as feed for further processing. These processes for VGO production differ significantly from the presently claimed method, which involves a step of upgrading a heavy hydrocarbon feedstock by a rapid thermal process in the presence of a particulate heat carrier. The VGO produced by the method of the present invention comprises different properties when compared to a VGO produced by distillation of a heavy hydrocarbon feed as suggested in either Mosby et al., or Chomyn.

In Mosby et al., it is disclosed that the feed oil is first processed using a primary atmospheric distillation tower (see Col 4, lines 65-66; in the absence of a particulate heat carrier) to remove volatile gasses (Col 5, lines 1-21), the primary reduced crude is then removed from the bottom of the primary tower, heated and may be introduced into a pipestill vacuum tower (again in the absence of a particulate heat carrier; Col 5, lines 23-30). Wet gasses are removed from the top of the pipestill vacuum tower, the VGO is removed in the middle portion of the tower, and vacuum-reduced crude is removed from the bottom of the tower (Col 5, lines 35-44; see Figure 3). The VGO is then sent for further processing to a catalytic cracking reactor that comprises a particulate catalytic heat carrier (see Figure 4). The process in Mosby et al. essentially described a step-wise distillation process of a heavy hydrocarbon feedstock. There is no teaching or suggestion in Mosby et al., that the heavy hydrocarbon feedstock is upgraded using a particulate heat carrier within an upflow reactor, collecting the gaseous and liquid products, and isolating the VGO from the liquid product, as defined in claim 7.

Similarly, in Chomyn, a process is described whereby the feedstock is mixed with steam and this mixture is introduced into the flash zone of a distillation tower (Col 2, line 55 to Col 3, line 5; in the absence of a particulate heat carrier). Again, this process involves distillation of the heavy hydrocarbon feedstock to produce the VGO. There is no teaching or suggestion in Chomyn that the heavy hydrocarbon feedstock is upgraded using a particulate heat carrier within an upflow reactor, collecting the gaseous and liquid products, and isolating the VGO from the liquid product, as defined in claim 7.

In Example 6 of the present invention (pages 46-54) several VGOs produced according to the present invention (ATB-VGO (243); ATB-VGO (255); ATB-VGO resid; KHC-VGO; Hydro-ATB-VGO) are compared with a control VGO produced using a standard

distillation processes (ANS-VGO) that are similar to those used in either Mosby et al. or Chomyn. The data presented in Tables 15 and 17 list characteristics of these VGOs, and indicate that the VGOs obtained following a rapid thermal process as defined in claim 17, exhibit novel properties compared to the VGO obtained by distillation in the absence of rapid thermal processing as disclosed in the present application. As described on pages 8, lines 38 and page 54, lines 3-11 of the present application, the VGOs of the present invention exhibit high levels of reactive compounds including aromatics (mono-aromatics and thiophene aromatics) that are relatively volatile. This property is conveyed in the lower analine point of the VGOs of the present invention, which is from about 110°F to about 150°F, when compared to the control VGO produced by distillation, which is characterized as having a higher analine point of about 168°F. As one of skill in the art would appreciate, and as stated on page 8, lines 7-8, a VGO characterized as having a higher levels of aromatics provides a feedstock well suited for conversion during catalytic cracking and results in higher yields, than a VGO that exhibit a higher analine point, and that comprise a lower amount of these aromatics. Applicant has amended claim 7 to indicate the analine point characteristic of the VGO produced by the defined method.

Accordingly, as Freel et al., Mosby et al. and Chomyn relate to different types of hydrocarbon processing, there would be no objective reason or motivation for one of skill in the art to combine the teachings of Freel et al. with those of Mosby et al. or Chomyn. Furthermore, the VGO products produced using distillation, essentially as described by either Mosby et al. or Chomyn, are characterized as having a higher analine point, reflective of a lower amount of aromatic compounds. These VGOs are different from those produced according to the present invention, which have a lower analine point and a higher amount of reactive aromatic compounds. A method to produce a VGO having a lower analine point is

not suggested or disclosed in Mosby et al, Choymn, or a combination of these two references.

As claims 8-15 each depend from claim 7, they include the claims limitations of claim 7. Therefore, claims 7-15 are inventive in view of the disclosure of Freel et al. and Mosby et al. or Chomyn, and removal of the rejection to claims 7-15, under 35 U.S.C. 103(a) is requested..

Respectfully submitted,

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